Page 11, Line 24, change "when the inlet links i, j" to –and if the inlet links i and j-

Page 14, Line 20, change "NO" to –no-

Page 14, Line 21, change "FIG. 4C" to –FIG. 4B-

Page 19, Line 20, change "controller and memory" to –controller 580 and memory 500-

Page 26, Line 28, change "MIS 1" to –MIS1-

Page 28, Line 10, change "$V(m,n,r)$" to $-V(m,n,r)$ network-

Page 29, Line 8, change "than equal to fiver" to –than or equal to five-

First applicant addresses the novelty and unobviousness of the current invention over the prior art. Also applicant submits that the U.S. Patent 5,801,641 by Yang et. al (over which the issues of novelty and unobviousness of the current invention is raised) is already referenced in the prior art section of the current application on page 3 lines 7-13. U.S. Patent 5,801,641 by Yang et. al. is based on the article by the same authors and entitled, "Non-blocking Broadcast Switching Networks" IEEE Transactions on Computers, Vol. 40, No. 9, September 1991. Applicant also submits that he has reviewed all the other cited references and they do not show the current invention or render it obvious.

I. RESPONSE TO ADDRESS THE REJECTIONS 1 AND 2:

<u>The general problem definition (common to the prior art and the current invention):</u>

The current invention and the prior art cited including U.S. Patent 5,801,641 by Yang et. al are about the following network:

1) The nonblocking design and operation of three-stage network for multicast connections comprising an input stage having r_1 switches and n_1 inlet links for each of r_1 switches, an output stage having r_2 switches and n_2 outlet links for each of r_2 switches. The network also has a middle stage of m switches, and each middle switch has at least one link connected to each input switch for a total of at least r_1 first internal links and at least one link connected to each output switch for a total of at least r_2 second internal links.

2) A multicast connection has a fanout of $\{1,2,...,r_2n_2\}$. In the said three stage network, a multicast connection can be fanned out in **one or more of the three stages** (i.e., to set up the connection and to fanout up to a maximum of $\{r_2n_2\}$ times). Since every switch in the third stage has internal multicast capability, if the multicast connections with fanout of $\{1,2,...,r_2\}$ is designed and operated in noblocking manner, the multicast connection with fanout of $\{1,2,...,r_2n_2\}$ is automatically designed and operated in nonblocking manner. Accordingly all the prior art and the current invention fanout the multicast connection **in the third stage** as needed.

The specific problem definition (The solutions to which the prior art and the current invention differ):

So the nonblocking design and operation of the three stage network is dependant on **how the multicast connection is fanned out in the first and second stages.** It also directly effects **the number of middle stage switches m required for the nonblocking operation.** Applicant notes that this is a tough mathematical problem (and also the reason for many patents issued addressing this problem).

The solutions patented in the prior art:

All the prior art including U.S. Patent 5,801,641 by Yang et. al **do not address any specific general method** for the fanout of the multicast connect in the first and second stages (so that the multicast connection is fanned out in the complete three-stage network up to $\{1,2,...,r_2n_2\}$). The only novelty in all the prior art is **the number of middle stage switches m required for the nonblocking operation.** However the mathematical equations designed in the prior art for the minimum number of middle stage switches m **are complex, heuristic and higher values (hence expensive to design). They are also dependant on many parameters.** For example in U.S. Patent 5,801,641 by Yang et. al the number of middle stage switches m is given by:

$$m \geq \min\left((n_1-1)x+(n_2-1)r_2^{\,1/x})\right) \text{ where } 1 \leq x \leq \min(n_2-1, r_2)$$

This is a complex and expensive solution.

The solutions disclosed in the current invention:

The current invention presents an elegant and general method for the fanout of the multicast connection, specifically **in the first stage (at most two times) and second stage (any number of times)** (so that the multicast connection is fanned out in the complete three-stage network up to $\{1,2,...,r_2n_2\}$). The mathematical equation for the minimum number of middle stage switches m **is small (cheaper to design), simple (depends only on n_1 and n_2) and also mathematically the minimum. The equation is also independent of r_1 and r_2.** The three-stage network is also **strictly nonblocking** (no need to rearrange any of the existing connections) and m is given by:

$$m \geq 2 * n_1 + n_2 - 1$$

And applicant submits that the current invention solves a long existing problem of strictly nonblocking multicasting operation of the three-stage network with mathematically the best switching solution.

<u>An example to show the superiority of the current invention over U.S. Patent 5,801,641 by Yang et. al:</u>

To directly compare the number of middle stage switches m required for the nonblocking operation of the three stage network discussed in U.S. Patent 5,801,641 by Yang et. al on column 5 between lines 20-36, it requires $m = 192$ according to U.S. Patent 5,801,641 by Yang et. al.

where as it requires $m = 95$ (= 3*n-1 where n = 32) (also it operates the network in strictly nonblocking manner) according to the current invention. Accordingly applicant submits that this is a significant improvement over the prior art.

1) **The rejection of Claims 36-84, 93-109 under 35 USC 102(b)**

Accordingly applicant submit that the claims do comply with § 102(b) and therefore request withdrawal of this rejection.

2) **The rejection of Claims 1-35, 85-92 under 35 USC 103(a)**

Accordingly applicant submit that the claims do comply with § 103(a) and therefore request withdrawal of this rejection.

II. RESPONSE TO ADDRESS THE REJECTIONS 3 AND 4:

Claims: Cancel all the claims of record and substitute new claims as follows.